ASYMPTOMATIC BRONCHIAL ADENOMA

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Adenoma of the bronchus produces two distinct roentgenologic patterns. The more common form exhibits the signs of obstruction to the airway of an entire lung, a lobe or a bronchopulmonary segment (fig. 1a and b). In such a case there is evidence of obstructive pneumonitis and loss of volume of the involved portion of the lung. Significant symptoms almost invariably are experienced by the patient. These may be cough productive of sputum, bouts of fever which may be accompanied by chills, and hemoptysis. In this form the roentgenologic signs and the clinical symptoms may be indistinguishable from those produced by bronchogenic carcinoma or other lesions which obstruct a bronchus. In cases of this sort the diagnosis is pursued and definitive treatment undertaken.

In its other form, bronchial adenoma produces on the roentgenogram the shadow of a round or oval mass, often at some distance from the hilum of the lung (fig. 1c and d). Many patients with this type of tumor experience no symptoms of respiratory disease. The fact that such a lesion is present

is discovered fortuitously when a roentgenologic examination is undertaken as part of a general examination, or in a survey of the general population. Because the roentgenologic manifestations are the only signs of disease, and because a diagnosis cannot be made in some instances without resorting to surgical removal, some physicians hesitate to carry the matter further and may even tell the patient to disregard the evidence of disease.

The existence of an asymptomatic form of bronchial adenoma has been recognized by others. Maier and Fisher reported 3 cases in 1947, while Santy, Galy and Duprez, in 1951, reported 1 case and reviewed the literature. Other isolated case reports are to be found.

We believe that bronchial adenoma occurs as an asymptomatic mass in the lung much more frequently than is generally recognized. Most reports in the literature deal with groups of patients who have presented themselves for treatment after the development of symptoms. It has been only in the past ten years that thoracic surgeons have been willing to undertake removal of asymptomatic pulmonary lesions. This has come about to some extent because of the increased use of roentgenologic methods in the examination of persons who are not ill and the resulting increase in discovery of such lesions. That some of these asymptomatic lesions are malignant is a fact which is now well established. Our experience with the asymptomatic form of bronchial adenoma

is limited almost entirely to this ten-year period and, as a matter of fact, 70 per cent of our cases have been encountered in the past five years.

Present Series of Cases

Our study is based on 100 cases of bronchial adenoma in which roentgenograms of the thorax were available. In 77 of these cases there was evidence of the obstructive form of the disease, and in only 1 instance was an absence of respiratory symptoms recorded in the history. In this case the patient, who was 18 years of age, was found to have an obstruction of the bronchus to the right upper lobe when a roentgenogram was made as part of his examination for induction into the Army (fig. 2). The pathologist's examination of the excised specimen disclosed an adenoma 1.5 cm. in diameter in the bronchus of the right upper lobe, with obstructive pneumonitis peripheral to it. These 77 cases will not be discussed further.

In the remaining 23 cases there was roentgenologic evidence of a mass in the lung without accompanying evidence of atelectasis or of obstructive pneumonitis. These 23 cases can be divided into a symptomatic group consisting of 6 patients, all of whom complained of respiratory symptoms before the mass was discovered roentgenologically, and an asymptomatic group, consisting of 17 patients who had experienced no respiratory symptoms up to the time of the roentgenologic examination which disclosed the presence of the tumor. In 3 patients of the asymptomatic group,

symptoms subsequently developed before surgical treatment was instituted.

The 17 patients included in the asymptomatic group ranged in age from 35 to 70 years. The average age was 52 years. Ten were males and 7 were females. In 11 instances the mass had been discovered before the patient came to the Mayo Clinic. Excluding 3 cases, in which operation was performed as soon as the lesion was discovered, the average known duration of the disease was a little more than three years. In 2 instances the roentgenologic examination which disclosed the presence of the tumor had been made more than eight years before surgical treatment was undertaken.

The roentgenologic appearance of these 17 adenomas was that of a sharply circumscribed round or roughly oval mass situated in the lung, usually at some distance from the hilum. The masses ranged in size from a diameter of 1.5 cm. to a diameter of 8 cm. The average diameter in 17 cases was 4 cm. Distances from the closest border of the mass to the bifurcation of the right or left main bronchus were measured on the roentgenograms and were found to range from slightly less than 1 cm. to 9 cm. (fig. 3). The average distance in these 17 cases was 4.5 cm.

Eleven of the tumors were situated in the right lung and 6 in the left. All lobes were represented in this group of cases. The most common site of involvement was the right middle lobe (right middle lobe 6, left lower lobe 4, right upper lobe 3, and left upper lobe and right lower lobe 2 each).

Definite evidence of increase in size of the tumor was obtained in 8 cases (fig. 4a and b). The average known duration of the lesion in these 8 cases was four and a half years, with a range from twenty-one months to nine years. In 4 instances, old roentgenograms could not be obtained for comparison. Five tumors showed no evidence of growth. The average known duration of these was slightly more than one year, with a range from four months to twenty-nine months.

In 3 of the 17 cases in the asymptomatic group, symptoms of pulmonary disease developed before operation was performed. In 1 instance a tumor had been known to be present for about fifteen months. In the other 2 cases the symptoms began one month and five months after discovery. Two of these patients experienced hemoptysis which caused them to seek surgical treatment. The other individual developed the clinical signs and symptoms of bronchial obstruction, and at the same time the roentgenologic appearance of the lesion changed from that of a mass 3 cm. in diameter, close to the hilum of the right lung, to one of obstruction of the anterior segment of the upper lobe (fig. 4c and d).

Nine of the 17 patients were examined bronchoscopically. Nothing abnormal was seen in 5. In 1 case an obstruction was noted in the bronchus of the right upper lobe, but tissue taken for biopsy from this region was reported to be inflammatory. In another case blood was seen in the bronchus of the right lower lobe. In this case tissue removed for biopsy showed nothing abnormal. In 2 instances a mass was seen through the

bronchoscope and the tissue obtained was reported to be characteristic of adenoma of the carcinoid type. Bronchoscopic examination of 1 of these cases had been carried out the year before, with negative results.

The lesion was completely removed in each of the 17 cases. There were 2 segmental resections, 11 lobectomies, 2 double lobectomies and 2 pneumonectomies. One patient died as the result of operation, and it was found at necropsy that the adenoma had extended to the lymph nodes of the mediastinum and to the liver. One other patient died forty-two months following operation; the cause of death is not known. The other 15 patients are living and well, without evidence of recurrence of the tumor. Excluding 2 patients who were operated upon recently, the average length of time from operation to last report from the patient was more than three years. The range was from one to six years.

In every case examination of the resected specimen revealed an adenoma of the carcinoid variety. In 1 instance there was collapse of the segment of lung peripheral to the lesion; this was the case in which signs of bronchial obstruction developed before operation. In the remaining cases a mass corresponding to the shadow seen on the roentgenogram was present. Evidence of metastasis was found in 1 case; this has been referred to in the discussion of surgical deaths.

The pathologist found evidence of deposition of calcium in 1 instance. This calcium could not be seen on the roentgenogram. It was the opinion of the pathologist

that the calcium found in the mass was not deposited in tumor tissue but rather in some tissue normally present which was engulfed by the growing tumor.

In the 6 cases which make up the symptomatic group the roentgenologic appearance of the adenoma corresponded to that seen in the 17 cases of the asymptomatic group, but in each instance the patient had experienced definite respiratory symptoms before a roentgenologic examination was made. In these 6 cases the average age of the patients and the average size of the tumors were identical to those in the asymptomatic group. Except for the fact that symptoms were present when the adenoma was first discovered, the only difference between the two groups was in the location of the mass. In general, the adenomas in the symptomatic group were situated closer to the hilum of the lung than were those in the asymptomatic group. Perhaps for this reason the bronchoscopist was able to see an intrabronchial mass in 3 of the 6 patients whom he examined. Tissue removed from 2 of these masses showed the microscopic appearance of adenoma, while that from the other was reported to be inflammatory.

All 6 of these patients were operated upon and 5 were alive and well at last report. The other patient died five years after operation; the cause of death is not known. The average length of time from operation to last report from these 5 patients was twenty-nine months. Five lobectomies and 1 double lobectomy were performed on the 6 patients in this group. Two of these patients were operated upon within one month of the onset of symptoms. In the other 4 cases

symptoms had been present for eighteen, nine, three and two years, respectively.

The roentgenologic shadows of the 23 adenomas included in both the symptomatic and asymptomatic groups were similar and were not diagnostic without additional information. All were circumscribed masses, round or roughly oval in shape, of homogeneous density and surrounded by normal pulmonary tissue. As such they did not differ from the shadows produced by some bronchogenic carcinomas, by solitary metastatic malignant nodules, by granulomas and hamartomas which show no roentgenologic evidence of calcification and by certain other benign conditions, such as bronchogenic cyst and inspissated chronic abscess. A recent report by Good, Hood and McDonald indicates that adenomas make up about 8 per cent of solitary mass lesions of the lung which are removed by the surgeons of the Clinic. These authors found 12 adenomas among 156 such cases.

Our experience indicates that adenoma of the bronchus can exist for a long time without causing significant symptoms. Apparently such a tumor continues to grow and may ultimately call attention to itself by causing hemoptysis or symptoms of bronchial obstruction. Fortunately, many of these tumors are being discovered today because of the increased use of roentgenologic examination of patients who are not ill and because of the inclusion of a roentgenogram of the thorax in the examination of patients who have complaints referable to organs other than the lung.

The fact that 20 of these 23 patients are alive and well today, and that 2 others died of apparently unrelated causes several years after operation, is a strong argument for surgical removal before symptoms develop or have existed for any appreciable time. McBurney, Clagett and McDonald have shown that the operation is more difficult and the incidence of postoperative complications greater if obstruction has been present for a sufficient length of time to allow suppurative disease to develop in the obstructed segment. Postoperative empyema developed in 8 per cent of patients operated on during the last six years of their reported experience (1945 through 1950) and 7 of their patients died as the result of pulmonary suppuration and its effects.

We continue to advocate the surgical removal of all circumscribed masses found in the lung, whether or not symptoms are present, provided the mass does not show roentgenologic evidence of calcification, and provided the mass cannot be proved to be metastatic from some malignant process elsewhere in the body. In this way we hope to prevent the development of pulmonary suppuration, which may result in a much more serious disease for the patient, and to eradicate those bronchogenic carcinomas which are masquerading in the roentgenologic appearance usually attributed to benign conditions.

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Legends

Fig. 1a and b. Adenoma 0.5 cm. in diameter obstructing the bronchus of the left upper lobe. This lobe is airless and reduced in volume. c and d. Adenoma 3.5 cm. in diameter situated in the peripheral portion of the antero-medial basal segment of the left lower lobe. There is no evidence of obstruction of a bronchus. The tumor was known to have been present for more than four years.

Fig. 2a and b. Adenoma 1.5 cm. in diameter obstructing the bronchus of the right upper lobe. There is bronchiectasis and pneumonitis in the lobe beyond the obstruction. The patient had experienced no symptoms of pulmonary disease.

Fig. 3a and b. Adenoma 2.5 cm. in diameter in the right upper lobe. The mass was almost entirely extrabronchial in location and had caused no obstruction. It had been discovered roentgenologically nine years before this picture was made. c and d. Adenoma 6.5 cm. in diameter in the right middle lobe. There was no obstructive pneumonitis found when the lobe was removed The tumor had been discovered about eighteen months before this roentgenogram was made.

Fig. 4 a and b. Adenoma 2 cm. in diameter in the right middle lobe. The roentgenogram shown in a was made on May 26, 1948, and that shown in b on January 24, 1951. The volume of the spherical mass has doubled during the interval of thirty-two months. c and d. Adenoma 3 cm. in diameter in the upper lobe near the hilum of the right lung. The

roentgenogram shown in c was made on April 1, 1948, to confirm a shadow seen on a miniature roentgenogram made during a survey of the population of Olmsted County, Minnesota. The patient had experienced no symptoms up to this time. The roentgenogram shown in d was made on July 1, 1948, after the patient had experienced two episodes of fever, night sweats and cough. It shows signs of obstructive pneumonitis in the anterior segment of the right upper lobe.

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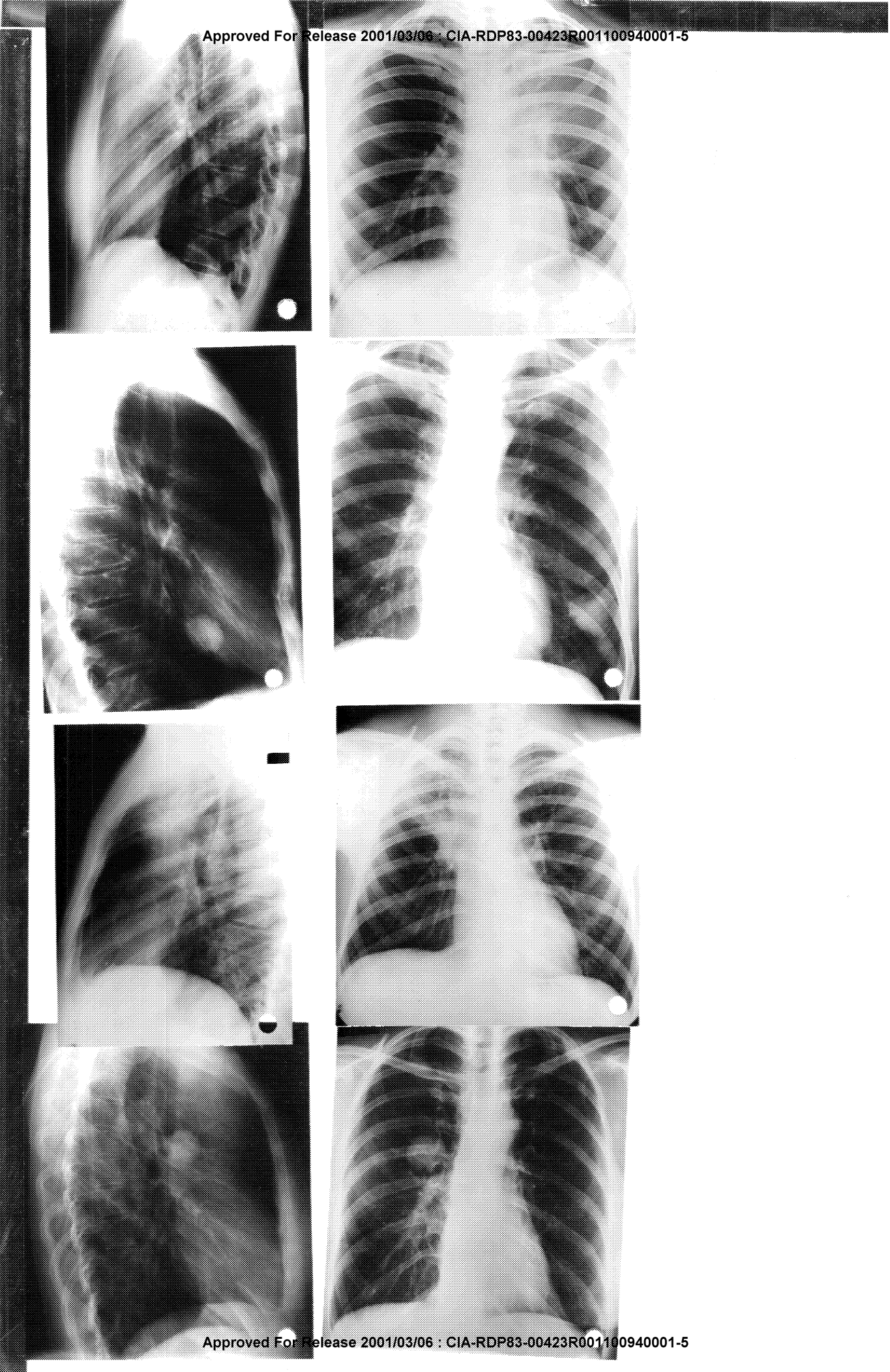

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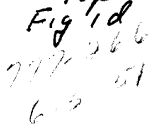

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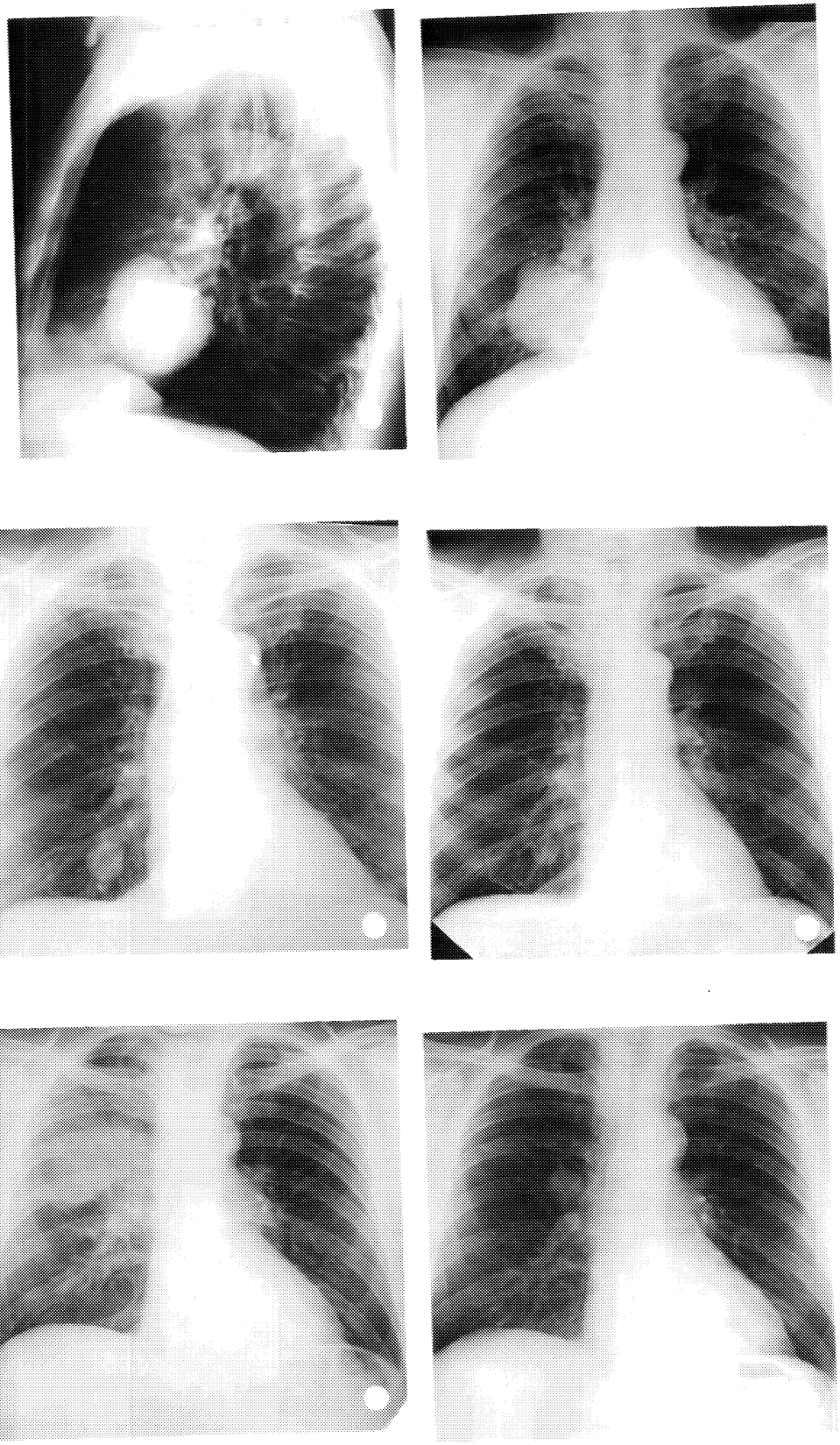

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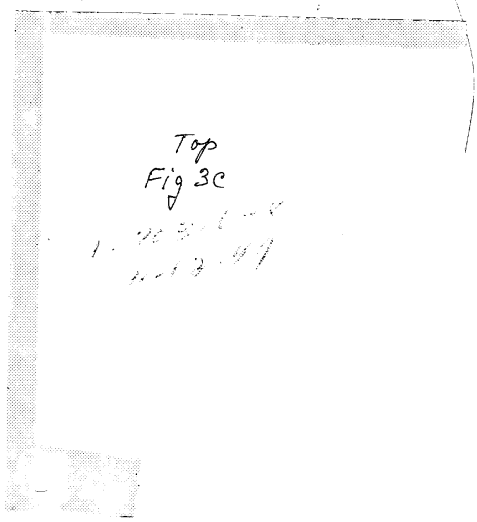

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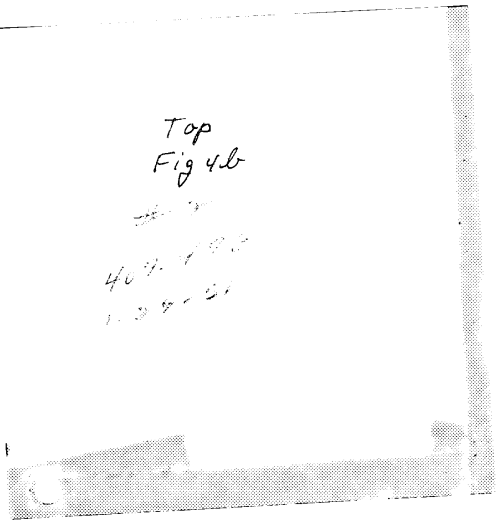

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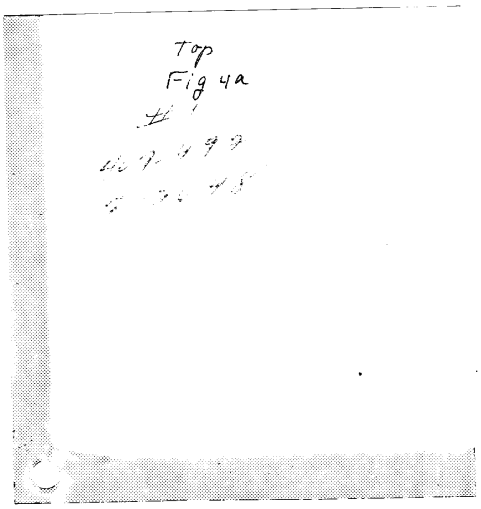

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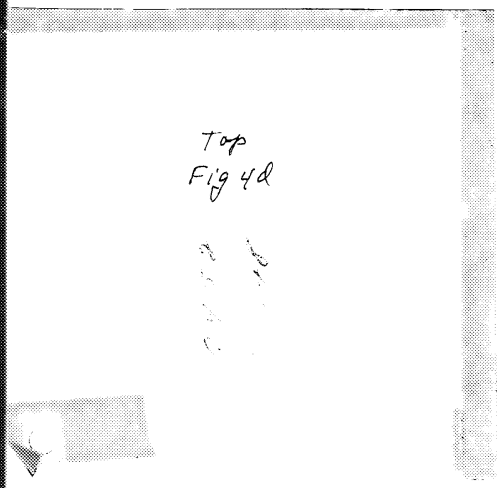

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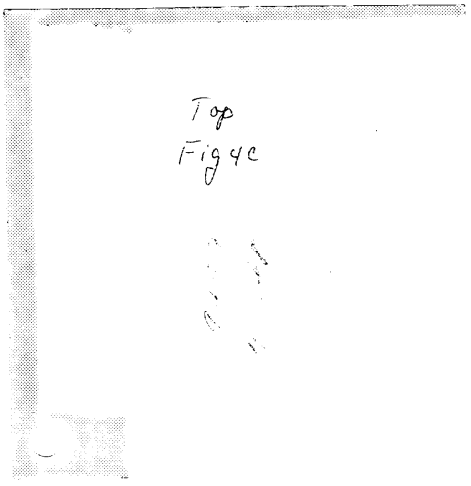

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